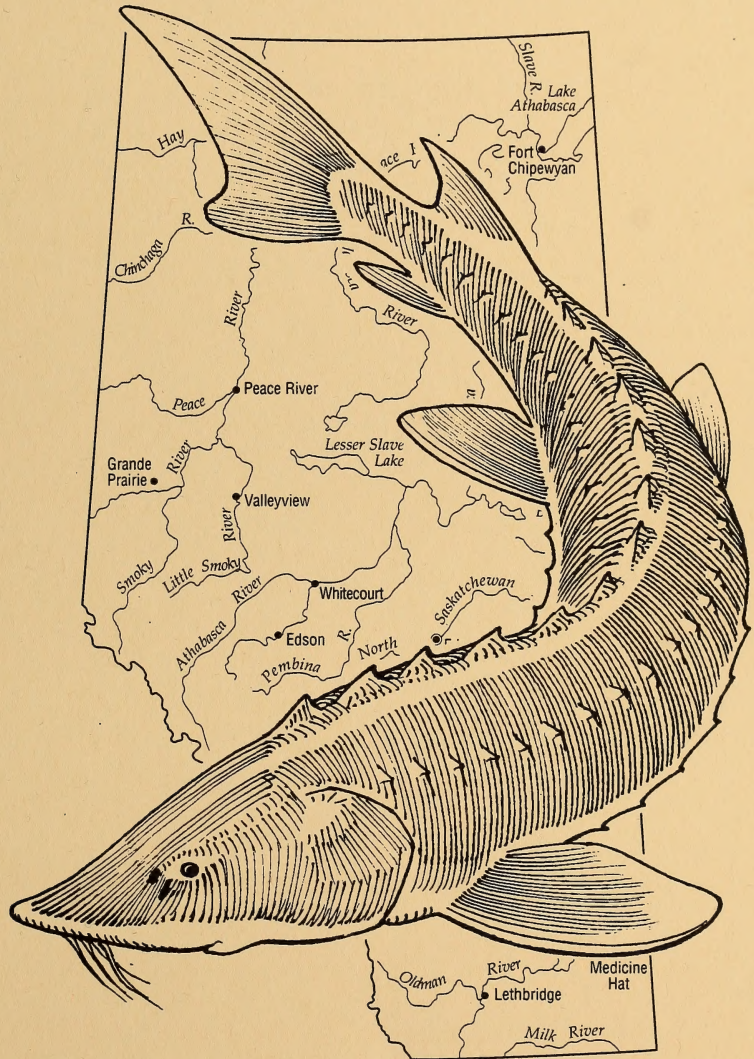


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Alberta's LAKE STURGEON Management Plan



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ALBERTA'S LAKE STURGEON MANAGEMENT PLAN

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PREFACE

The following document summarizes information on lake sturgeon in Alberta and outlines management principles, policies and strategies that have been adopted. The document is presented in a nontechnical fashion to better serve as public information; however, considerable information was obtained from published papers and files.

The following authors, whose papers are referenced on page 19, are acknowledged for their contributions to the scientific literature and to the understanding of lake sturgeon: F.G. Bishop, G.N. Haugen, J.J. Houston, D.S. Radford, R.L.&L. Environmental Services Ltd., G. Rousseau, W.B. Scott and E.J. Crossman, R.G. Wallace and D.V. Watters.

Appreciation for their involvement is extended to staff of Alberta Fisheries Management Division, in particular, Frank Bishop (retired), Daryl Watters, Glen Clements and Duane Radford. The document was reviewed by Editorial Services, Alberta Environmental Protection.

REMARKS

The following documents are referred to in the text of the report and are available for reference in the Library of the Department of the Interior, Ottawa, Ontario.

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ABSTRACT

This document consists of an overview of lake sturgeon in Alberta and the management plan to provide unique recreational fishing opportunities through the conservation of the species.

Lake sturgeon (*Acipenser fulvescens*) in Alberta is a unique species consisting of only two populations--one in the South Saskatchewan River drainage and one in the North Saskatchewan River drainage. Overharvest prior to the 1940s decimated both populations to near extinction. Although these populations are now capable of sustaining some level of recreational fishing, they have not achieved full recovery to their former state. Control of harvest is necessary to increase the numbers of young and old lake sturgeon in both populations to achieve full recovery and prevent future population declines.

Lake sturgeon must be protected to ensure recreational benefits. Full recovery of sturgeon populations requires managing for conservation first. Conservation in the context of this plan is focused on the net gain in the production of sturgeon, but also includes the wise use of the resource. Maintenance of a unique recreational experience must continue to be an important objective in the plan; however, the primary priority based upon conservation and population recovery must not be compromised.

New sportfishing regulations were developed based on angler survey results and sturgeon population status in Alberta. Commencing in 1997, the Sturgeon Fishing Licence will be valid only for the keeping of one sturgeon (1 tag) over 130 cm in total length from the South Saskatchewan River system and only during the time period of June 16 to March 31. Fishing opportunities for sturgeon during their spawning period (April 1 to June 15) and in the North Saskatchewan River system throughout the year will be catch and release only.

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Lake Sturgeon
Acipenser fulvescens

1.0 SPECIES OVERVIEW

1.1 Classification and Description

Lake sturgeon (*Acipenser fulvescens*) is undoubtedly the most unique game fish found in Alberta. The sturgeon family belongs to an ancient group of fishes dating back nearly 300 million years to the Devonian period. These primitive relics of the past have skeletons made primarily of cartilage rather than bone. The largest freshwater fish in the Northern Hemisphere belong to the sturgeon family.

Lake sturgeon are not colourful, being olive-grey to dark grey with a whitish belly; however, their primitive appearance is very noticeable. The body is heavy, torpedo shaped with five rows of hard plates called "scutes" extending from head to tail. These plates are pointed and sharp on young sturgeon, but become smooth on adults. The upper lobe of the caudal fin is much longer than the lower lobe (heterocercal tail). Lake sturgeon have a long, flattened snout with four large barbels located in front of a ventral sucking mouth.

1.2 Distribution and Status

1.2.1 Distribution

Lake sturgeon have a wide distribution in Canada, from Alberta to Quebec, in the watersheds of the Hudson-James Bay and Great Lakes. In the United States, lake sturgeon are common in most of the Mississippi drainage.

Lake sturgeon populations in Alberta were part of a larger population whose range was centred in the province of Saskatchewan and extended into Alberta and Manitoba (Figure 1). The construction of hydroelectric operations in the province of Saskatchewan since the 1960s has fragmented this larger population of lake sturgeon into at least three separate populations. The population in the South Saskatchewan River is separated from the population in the North Saskatchewan River by the dam forming Lake Diefenbaker. Both of these populations are now separated from the population in the lower Saskatchewan River and Cumberland Lake area by the dam forming Codette Lake.

In Alberta, lake sturgeon are found only in the South Saskatchewan River and North Saskatchewan River drainages. Lake sturgeon from the South Saskatchewan River extend into the lower sections of the Oldman and Bow rivers, which join west of Medicine Hat to form the South Saskatchewan River. A few lake

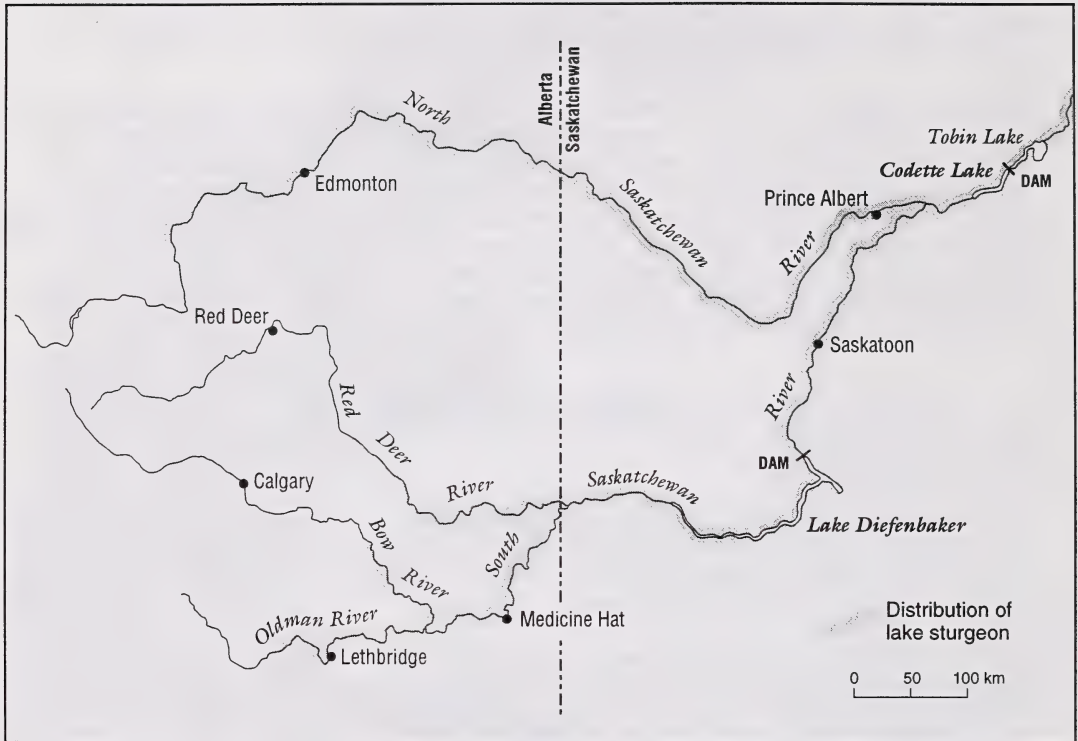


Figure 1: General distribution of lake sturgeon in the North and South Saskatchewan river systems in Alberta and Saskatchewan

sturgeon from the population in the South Saskatchewan River are found in the lower portion of the Red Deer River. The Red Deer River crosses the Alberta border before entering the South Saskatchewan River.

1.2.2 Historical Status

Although sturgeon numbers must be considered below historical levels, current numbers are higher than in the recent past. Heavy harvest by gill net and long line before 1940 caused lake sturgeon to almost disappear from Alberta. Fortunately, a complete fishing closure from 1940 to 1968 allowed populations to recover enough to support a limited sportfishery under special regulations.

In 1968, a special sturgeon fishing licence was introduced to allow anglers to fish for and keep sturgeon. In 1974, a minimum-size limit of 90 cm (36 inches) in total length was introduced to protect young sturgeon. Additional protection was implemented in 1975 by reducing the annual limit to two (2) tags per licence. A small adjustment in the minimum-size limit to 100 cm (40 in.) occurred in 1984, a few years after measurements were converted to the metric system. Since 1987, anglers who practice catch-and-release sturgeon fishing have not been required to hold a special licence. Only those anglers who wish to keep lake sturgeon must have a Sturgeon Fishing Licence. The number of Sturgeon Fishing Licences issued increased steadily from a low of 24 in 1971/72 to high of 552 in 1982/83, then decreased to an average of 337 since 1984/85.

Lake sturgeon populations in the provinces of Saskatchewan and Manitoba did not collapse and fishing seasons were not closed in 1940. Lake sturgeon remained more abundant in these provinces and continued to sustain fisheries; however, habitat changes and increased fishing pressures have more recently contributed to significant declines in the number, age and size of lake sturgeon in both provinces.

Since 1995, all sturgeon caught by angling in Manitoba must be released. In Saskatchewan, sportfishing regulations for sturgeon were also changed in 1995. At present, anglers in Saskatchewan must have a sturgeon licence to keep sturgeon and are allowed an annual limit of two.

1.2.3 Current Status in Alberta

The lake sturgeon population in the South Saskatchewan River appears to have remained relatively stable over the past 25 years based on information collected from anglers (Figure 2). Although the numbers of sturgeon reported caught has increased

during the 1980s and 1990s, the population in the South Saskatchewan River does not likely exceed 5000 fish (population estimated at 3700 in 1986 [R.L.&L. Ltd. 1991]). Changes in population structure in the South Saskatchewan River between 1973 and 1984 can be attributed to the establishment of a minimum-size limit (90 cm) and annual limit (2) in 1974 and 1975, respectively. Similarly, population differences between 1984 and 1991 can be attributed to the increase in the minimum-size limit (100 cm) in 1984.

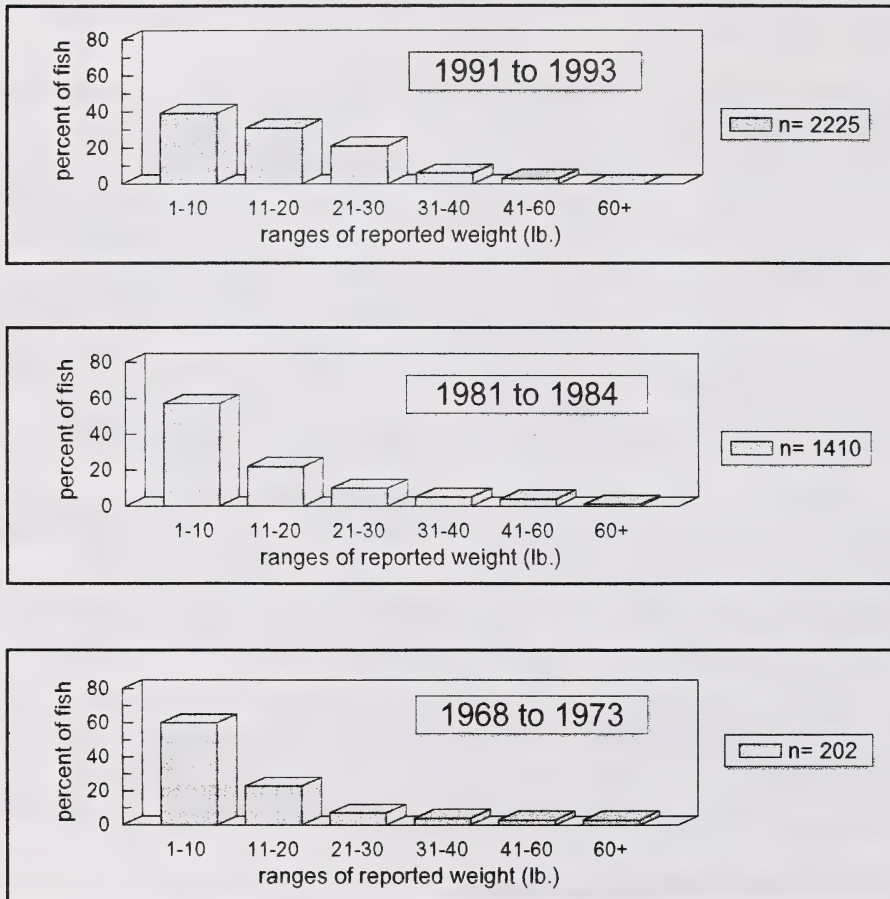


Figure 2. Comparisons of weight frequencies of lake sturgeon caught by anglers from the South Saskatchewan River and reported on angler survey questionnaires (data recalculated from Bishop 1995, 1993, 1986, and 1983; and Radford 1976).

Although the sportfishery occasionally produces sturgeon over 60 lb.(27 kg) in weight, Figure 2 indicates the majority of fish reported by anglers weigh less than 20 lb.(9 kg).

Recent studies on sturgeon in the North Saskatchewan River show a similar pattern of weight distribution (Figure 3). These skewed distributions indicate that Alberta sturgeon populations are dominated by small fish and have not fully recovered to include normal numbers of large fish.

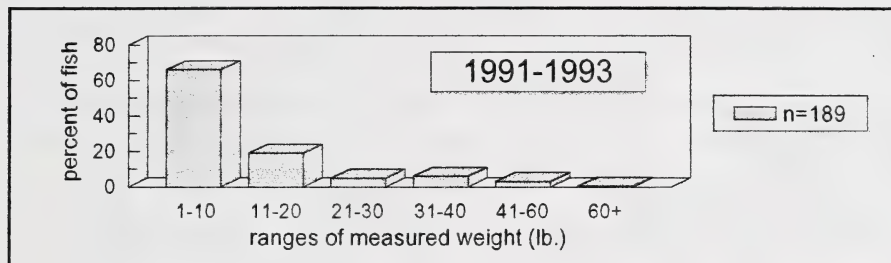


Figure 3. Weight frequency of lake sturgeon measured during studies on the North Saskatchewan River (data modified from Watters 1993).

The lake sturgeon population in the North Saskatchewan River has been slow in its rate of recovery and remains in a vulnerable state. Recent biological studies indicate the presence of a small population, possibly fewer than 1000 fish. The population is composed primarily of fish between 70 and 110 cm in total length that weigh less than 10 kg (Figure 4). This group of fish is dominated by sturgeon hatched in the years 1985 and 1986, representing ages 9 and 8 respectively in 1994 (Figure 4). These stronger year classes are preceded and followed by irregular, weaker year classes.

1.3 Biology of Lake Sturgeon

The biology of lake sturgeon in Alberta is not fully understood. Considerable variation occurs in the length, weight and state of maturity among different individuals of the same age, which makes it hard to interpret small sample sizes. It is also very difficult to determine accurate ages for older lake sturgeon. Although it is difficult to sample for this species in the large rivers they inhabit, ongoing studies on the South and North Saskatchewan rivers are providing more information on the biology of this species.

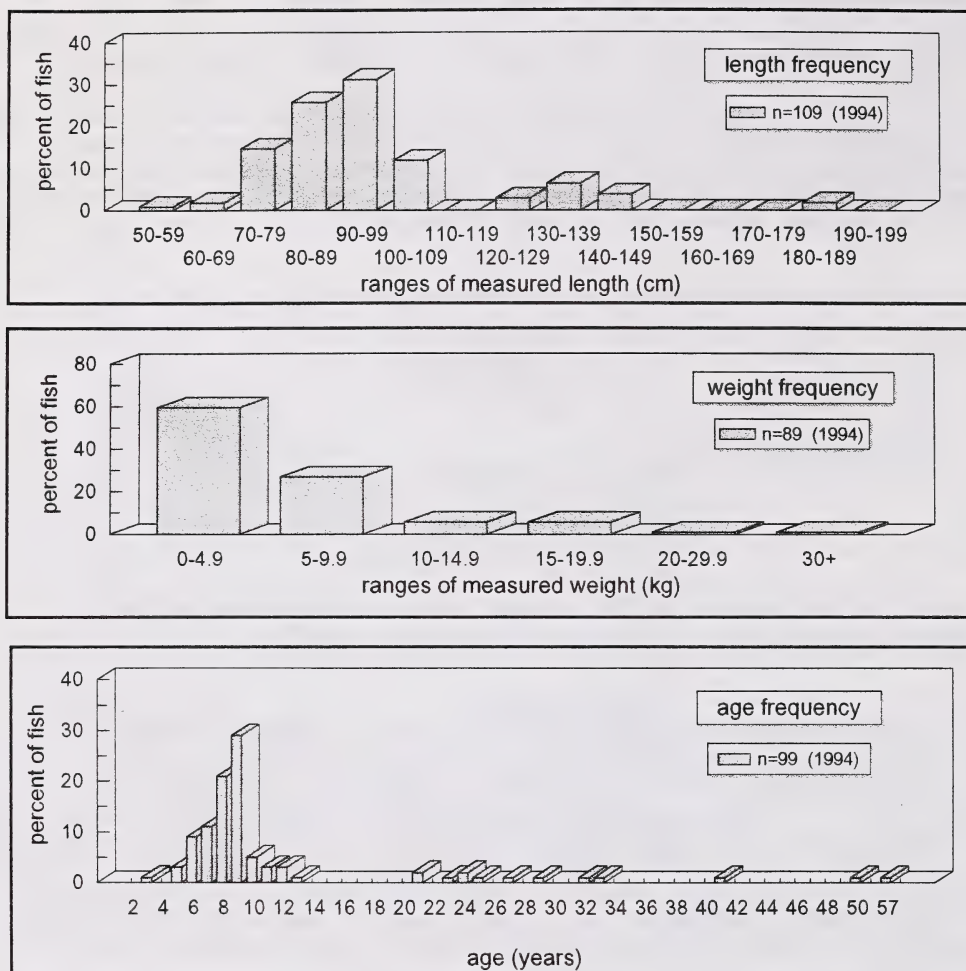


Figure 4. Length, weight and age frequencies for lake sturgeon sampled from the North Saskatchewan River in 1994 (data modified from Watters 1995).

Combined information from available studies in Alberta provide general length-weight, age-weight and age-length relationships for lake sturgeon (Figure 5). In Alberta, sturgeon generally reach a length of 100 cm (40 in.), roughly 11-20 lb. in weight (5-9 kg), between the ages of 8 and 12. A length of 130 cm (51 in.), about 21-30 lb. (9.5-13.6 kg), is generally reached between the ages of 20 and 25.

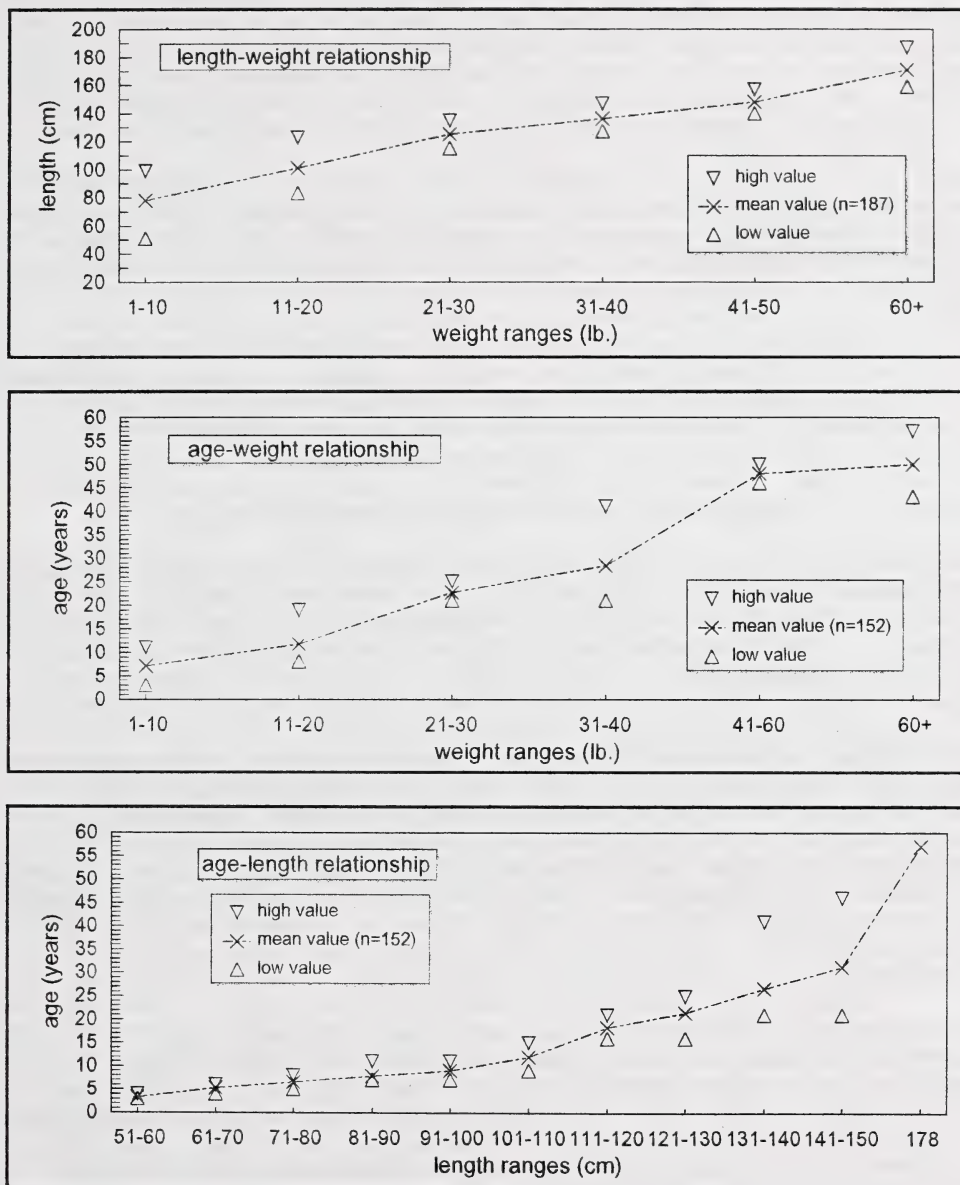


Figure 5. Length-weight, age-weight and age-length relationships for lake sturgeon sampled from the South and North Saskatchewan rivers (data modified from Haugen 1969, R.L. & L. Environmental Services Ltd. 1991 and Watters 1995).

Lake sturgeon are slow growing, but because they are long-lived fish they reach the largest sizes and oldest ages of any fish in Alberta. Males often live to 55 years of age and females can reach 80 years of age. During the study on the North Saskatchewan River in 1991, a lake sturgeon measuring 178 cm (71 ins.) was aged at 62 years. Historical records refer to lake sturgeon in Canada weighing over 100 kg and being more than 150 years old.

Alberta populations have the potential to produce world-class weights. The Alberta record is 47.7 kg (105 lb.) for a lake sturgeon with a length of 154.9 cm (62 in.) taken in 1981 from the South Saskatchewan River.

Lake sturgeon require more years to reach maturity than any other fish in Alberta. Females seldom spawn for the first time until between the ages of 20 and 25. Males mature slightly younger, possibly between ages 16 and 20. Full maturity in females is not reached until between the ages of 25 and 30, which would put these fish between 130 and 140 cm in length, and about 30 to 40 lb. (13.5-18 kg) in weight (Figure 5).

Not all sturgeon spawn for the first time at the same age and, after reaching maturity, most will not spawn in each year thereafter. The interval between spawning is usually four to six years in females and two to three years in males. These biological factors affect the number of sturgeon capable of spawning in any given year.

Lake sturgeon spawn during May and June at water temperatures between 10°C and 21°C. Constant, non-fluctuating water flows stimulate more and larger sturgeon to move onto spawning grounds, and help to trigger spawning activities. Spawning lasts for only a few days. The eggs are small (2.7-3.5 mm) and black when ripe. Egg counts for females sampled from the South Saskatchewan River in 1968 ranged from 117 450 to 607 400 for females weighing 15.5 to 45.5 kg (average of 1188 eggs/kg of fish weight).

Female sturgeon do not build a nest, but instead, shed and scatter their eggs in the river current. The male swims close to and slightly above the female so that his milt covers and fertilizes the eggs. The adhesive eggs stick to rocks and hatch in 5 to 8 days. The young spend another 9 to 18 days absorbing nourishment from their yolk sac before beginning to feed on small organisms. Lake sturgeon fry develop quickly and look like miniature adults when only 2-3 cm in length. Spawning areas for lake sturgeon have not been well documented in Alberta; however, suitable shallow areas of rock and gravel with faster water current are available.

Lake sturgeon often are congregated in holes along rivers or travel in loose aggregations over the more productive, shallow areas (4-9 m) for feeding. Sturgeon search the bottom for food, aided by their sensory barbels, and suck up basically anything edible. The primary food items consist of small clams, insect larvae, snails, leeches, plant material and small fish.

Tagging studies indicate lake sturgeon often stay in the same general areas for extended periods, but occasionally move around within the river. A few lake sturgeon in the North Saskatchewan River have been observed travelling more than 100 km in less than a month. Lake sturgeon are known to move back and forth across the Alberta-Saskatchewan border in both the South and North Saskatchewan rivers. The significance of fish movements between river sections in Alberta and Saskatchewan is not clearly understood, nor is the extent of the exchange of fish or the dependence of each subpopulation on the other.

1.4 Major Limitations to Production

The size of sturgeon populations is limited by the productive capacity of their habitat, the biological constraints of the species and the effects of harvest. These limiting factors to lake sturgeon production are outlined below:

1. Productive Capacity of the Habitat

The maintenance of spawning habitat and water quality are important. The productive capacities of the South and North Saskatchewan rivers for sturgeon have not been studied in detail; however, neither system supports a large population. Both river systems have been impacted since the early 1900s from agricultural, industrial and urban developments that have resulted in changes in stream flows, sediment loads and contaminant levels.

The construction of hydroelectric operations in the province of Saskatchewan since the 1960s has fragmented the larger population of lake sturgeon. The effects of this fragmentation have not been fully studied; however, habitat changes have contributed to a severe decline in lake sturgeon in the Lower Saskatchewan River (Cumberland Lake Area).

2. Biological Constraints

Lake sturgeon are slow growing and late maturing (25-30 years), and individuals only spawn once every 2-5 years. These biological characteristics contribute to the low production rate of new fish to the population and the slow rate of population recovery from overharvest and habitat degradation.

3. Overharvest

A healthy lake sturgeon population should contain large, old fish, including 50 to 80 year-olds, and be able to sustain some harvest without serious impact. However, overharvest of lake sturgeon prior to the 1940s decimated Alberta populations to near extinction. The fishing closure from 1940 to 1968 and fishing regulations since 1968 have resulted in improvements in populations. Although these populations are now capable of sustaining some recreational fishing, they have not achieved full recovery to their former state.

Alberta's sturgeon populations have not had sufficient time to reestablish the older age classes lost prior to 1940. For example, sturgeon hatched in 1940 have only reached the age of 56 years, which does not reflect the limit of their potential life span. Harvest of lake sturgeon since 1968 has influenced the numbers that survive to reach older ages. Lake sturgeon currently become vulnerable to sportfishing harvest in Alberta at least 10 years before reaching maturity and 50 years before reaching old age.

Although fishing pressure has remained similar over the past decade, fishing success has increased because anglers have become more knowledgeable on how to catch sturgeon and where to fish. To achieve full population recovery and prevent future declines, continued control of harvest is necessary to increase the numbers of sturgeon of all ages. At present, there is minimal surplus supply beyond the needs of conservation through self-reproduction.

Many anglers consider poaching, which includes incidental harvest by anglers not aware of licence requirements, licensed anglers failing to comply with regulations and the deliberate illegal harvest of sturgeon, as a serious limitation to sturgeon production.

2.0 MANAGEMENT PLAN

2.1 Management Policies

The intent of this management plan is to classify lake sturgeon as a unique species that must be managed for conservation. In this context, conservation is focused on the net gain in the production of sturgeon, but also includes the wise use of the resource and maintenance of a unique recreational experience.

The *Fish and Wildlife Policy for Alberta* (Fish and Wildlife Division 1982) states: "it is incumbent upon the Government, as the resource steward, to ensure that appropriate use is made of the fisheries resource and that it is passed on to succeeding generations as it was received. The primary consideration of the Government is to ensure that fisheries populations are protected from severe decline and that viable populations are maintained." Fish are a crown resource and must be managed to meet the requirements of present users without compromising the ability of future generations to meet their own needs.

The intrinsic enjoyment of recreational fishing is becoming a high priority with anglers. Lake sturgeon provide opportunities in close proximity to large cities in areas where other fishing opportunities are limited. Satisfying recreational benefits regarding fish harvest must emphasize nonconsumptive use, with very limited harvest, to sustain recreational opportunities.

In 1940, the complete closure of fishing for lake sturgeon was implemented with the intent of preventing the extinction of the species from Alberta. Sturgeon populations in Alberta have improved; however, they could face future declines because of increased sportfishing harvest. Therefore, sturgeon management in Alberta will be consistent with the following goal:

"To achieve full recovery of lake sturgeon populations and to sustain recreational benefits to Albertans."

The above sturgeon management goal received strong support from sturgeon anglers in Alberta. The majority of anglers surveyed (79.3%) supported the management of sturgeon populations to continue their recovery to produce more fish, as well as larger sizes and ages of fish, than there are now (*Angler Opinion Survey on Sturgeon Management in Alberta*, Berry 1996). In keeping with the above goal, the following policies have been formulated:

2.1.1 Fish Conservation Policy

The fish conservation policy is to continue to recover lake sturgeon populations by achieving net gains in production. To satisfy this policy, the following objectives must be met:

- a) Maintain the current distribution of populations;
- b) Increase the numbers of fish within these populations; and
- c) Increase the size and age distributions to include increased numbers of the larger, older fish.

2.1.2 Habitat Maintenance Policy

The habitat maintenance policy is to maintain, improve and develop critical habitat necessary for all life stages, where possible, to achieve net gains in lake sturgeon production, through the following activities:

- a) Maintain the productive capacity of habitats; and
- b) Enhance the productive capacity of habitats, where possible and appropriate.

2.1.3 Fish-Use Policy

The fish-use policy is to provide recreational fishing for lake sturgeon, so long as the primary emphasis upon conservation and continued population recovery are not compromised. Fish production is allocated to conservation first. Recreational fishing for lake sturgeon will be promoted by achieving the following objectives:

- a) Establish a philosophy of nonconsumptive angling and intrinsic enjoyment of the experience; and
- b) Aim for low hooking mortality on released lake sturgeon.

The fish conservation, habitat maintenance and fish-use policies will result in the following future conditions:

- an increase in the number of lake sturgeon;
- an increase in the size and age of lake sturgeon; and
- sustainable recreational fishing opportunities.

The continued recovery of lake sturgeon populations is guided by the principles outlined in *A Fish Conservation Strategy for Alberta* (Fish and Wildlife Division 1990) as follows:

1. The depletion or extirpation of lake sturgeon populations will not be permitted.
 - controls to reduce lake sturgeon harvest and habitat losses must be maintained.

2. Lake sturgeon populations will be maintained by natural reproduction.
 - sufficient mature fish and suitable spawning habitat must be maintained.
3. Lake sturgeon management will be based on fundamental ecological principles and factual information.
 - accurate and timely information on lake sturgeon populations must be gathered, using sampling techniques that result in the least damage possible to the fish being studied.
4. Public participation will be included in the management process.
 - public support must be maintained through review of management planning processes and volunteerism in project studies.
5. The "user pays" philosophy should be made applicable to the financing of the management and enhancement of fish resources.
 - A portion of the general *Sportfishing Licence* fee is directed into the *Fish and Wildlife Trust Fund*, *Buck for Wildlife Program*, and distributed equally to *Fisheries Habitat Development* and *Fisheries Management Enhancement*. Anglers who wish to keep sturgeon are required to purchase a special sturgeon fishing licence in addition to their sportfishing licence.

2.2 Management Strategies

Fisheries management strategies must achieve and maintain policies to reach the management goal for lake sturgeon. Each strategy requires implementation of management actions.

2.2.1 Fish Production Strategy

The fish production strategy addresses the factors influencing the maintenance of a stable fish population. Fish production is primarily controlled by the productive capacity of the habitat and the productive capacity of the species; however, fish harvest has a large effect on the size and number of fish present in the population.

Each water body has a limit to the biomass or total weight of fish that it can support. This biomass can consist of many small fish, a few large fish, or a mixture of fish sizes. A broad range of fish sizes consisting of many year-classes is best, and there must be a sufficient number of mature fish to support spawning and subsequent recruitment.

Maintenance of a stable fish population involves the management of the factors described by the following simple model:

$$PM = (R + G) - (NM + FM)$$

where: PM is population maintenance,
R is recruitment,
G is growth,
NM is natural mortality, and
FM is fishing mortality.

Fish losses (natural mortality plus fishing mortality) cannot exceed fish gains (recruitment plus growth), if the fish population is to remain stable or grow. The population maintenance equation represents a stable population when fish gains equal fish losses. If gains are greater than losses, the fish population increases. However, when losses exceed gains, the fish population declines.

Fish recruitment relies on the process of fish spawning and is represented by the annual addition of young fish to the population. Successful recruitment to lake sturgeon populations is dependent upon the available numbers of spawners. Lake sturgeon in both the South and North Saskatchewan rivers reach the current minimum-size limit of 100 cm between the age of 8 and 12, before reaching maturity. Maturity generally occurs in sturgeon between 130 and 140 cm in total length (ages 25-30).

Strict control of harvest of all ages is required to ensure recruitment, and to maximize spawning potential more mature sturgeon must be protected from harvest, especially during their spawning period.

Recruitment to lake sturgeon populations in Alberta could, in part, depend on spawning areas in the province of Saskatchewan and fish migrating upstream into Alberta. However, it is more likely that sturgeon spawn in Alberta. It is also possible that spawning areas in Alberta could contribute to lake sturgeon populations in the province of Saskatchewan through downstream movements. A better understanding of the life histories of lake sturgeon populations is required, in both provinces, to ensure proper management for continued natural reproduction.

Fish growth is the increase in size of the fish, which reflects the productivity of the habitat and the density of the population. Lake sturgeon grow slowly because of the nature of their biological requirements. Protecting sturgeon from harvest to allow them to live long enough to grow larger is essentially all that can be done to improve the size of sturgeon. Full population recovery is dependent upon more sturgeon reaching older ages (50-80 year olds).

Natural mortality refers to losses of fish as the result of natural causes such as diseases, predation or environmental conditions. It can be difficult to reduce the influence of these factors beyond addressing habitat maintenance concerns. The protective plates on the young and the large size of the adults protect lake sturgeon from predation. Natural fish losses of lake sturgeon from Alberta populations is also possible because of downstream migrations of fish to river sections in the province of Saskatchewan.

Fishing mortality is represented by the fish that are removed by fishing activity--harvest plus the death of released fish (called hooking mortality). Sportfishing must be regulated to manage lake sturgeon in accord with the productive capacity of the species and its habitat. Continued recovery of populations requires the reestablishment of the older age classes and an increase in the number of sturgeon at all ages.

The existing regulation of two sturgeon per year over the length of 100 cm has been working to maintain populations; however, it is no longer promoting continued recovery because of increased fishing pressure and the harvest of sturgeon that have not reached maturity. An increase in the minimum-size limit would protect more spawners and direct harvest to only the largest of fish. Although many anglers practice catch and release, most licensed sturgeon anglers in Alberta have expressed a desire for some harvest and have a preference for a large sturgeon.

Continued recovery of lake sturgeon populations in the South and North Saskatchewan rivers requires separate management of the two systems to reflect differences in population status and fish use between the two systems. Sturgeon management strategies in Alberta and Saskatchewan should emphasize conservation in a compatible manner; however, sportfishing regulations do not necessarily have to be identical provided differences in regulation reflect differences in population status and fish use.

2.2.2 Habitat Maintenance Strategy

Fish production is a function of their habitat and therefore dependent on the provision of and maintenance of sufficient habitat and migration routes. The habitat maintenance strategy must emphasize the need to minimize impacts to lake sturgeon habitat. In this respect, impacts anywhere in the watershed of the South or North Saskatchewan rivers could influence lake sturgeon production.

2.2.3 Public Information and Education Strategy

Greater public awareness is essential to increase support for the maintenance of lake sturgeon populations and quality habitat. Public awareness can be accomplished by providing a range of communications to convey information on lake sturgeon management and habitat needs.

2.2.4 Enforcement Strategy

It is difficult to achieve public compliance with sportfishing regulations through enforcement without first achieving public acceptance of the management plan through public education. A well-informed public will assist enforcement efforts. This can be achieved by incorporating a public information and education program into the annual work plan for enforcement priorities in Fish and Wildlife Districts along the South and North Saskatchewan rivers. Similar sportfishing regulations for lake sturgeon in Alberta and Saskatchewan on the river portions in the immediate vicinity of the border would assist enforcement efforts. Sturgeon anglers consider poaching as a serious problem that must be addressed with increased enforcement of regulations.

2.3 Management Activity Requirements

2.3.1 Musts

To achieve and maintain the lake sturgeon management plan, the following management activities must be carried out:

1. Maintain appropriate sportfishing regulations to keep harvest levels in line with fish production levels that permit the continued recovery of populations (regulation requirements are outlined in section 2.4).
2. Conduct periodic monitoring of populations to assess needs and potential changes to regulations.
3. Conduct specific studies of life history including age, growth, maturity, spawning and movements, and population estimates.
4. Identify and maintain adequate habitat protection guidelines to minimize impacts from disturbances within the South and North Saskatchewan river systems and ensure instream flow needs are adequate to sustain these fisheries.
5. Continue studies to identify critical habitat, such as spawning sites, requiring protection.
6. Communicate, to the public, the management and biological requirements for lake sturgeon conservation, and promote public involvement in the management of lake sturgeon.

7. Set priorities for public education, regulation enforcement and protection of habitats as part of district enforcement work plans.
8. Conduct surveys of anglers fishing lake sturgeon to determine catch rates and harvest levels.
9. Determine the carrying capacity of the South and North Saskatchewan rivers for lake sturgeon, conservation needs, and the numbers that constitute a harvestable surplus.

2.3.2 Wants

To maintain the lake sturgeon management plan, the following management requirements are desired:

1. Promote compatible management strategies with the Saskatchewan Fisheries Branch for the protection and maintenance of lake sturgeon populations throughout the South and North Saskatchewan rivers.
2. Evaluate and update this management plan as a working document to reflect new information as it becomes available.

2.4 Sportfishing Regulations

As part of the review on lake sturgeon management during the development of this document, a survey of sturgeon anglers in Alberta was conducted (*Angler Opinion Survey on Sturgeon Management in Alberta*, Berry 1996).

Anglers fishing the South Saskatchewan River were evenly split between a 0-limit and a season closure to protect sturgeon spawning. If they were only allowed to keep one per year, more anglers preferred large sturgeon than small sturgeon. Although opinion on size limits differed, most anglers supported a minimum-size limit of 100 cm or larger. About 60% of the anglers favoured an annual limit of 1 or 0. The desire to harvest some sturgeon is not surprising because the survey only included anglers who held a Sturgeon Fishing Licence, which is only required if the angler wishes to keep sturgeon.

Most anglers fishing the North Saskatchewan River indicated they would not keep any lake sturgeon and favoured catch-and-release fishing throughout the year. Two-thirds of these anglers supported a 0-limit rather than a season closure during the sturgeon spawning period.

Overall, anglers who fished the North Saskatchewan River had a different fish-use pattern than anglers who fished the South Saskatchewan River. The differences in fish-use patterns coupled with differences in population status of sturgeon in the two river systems indicate that the two systems should be managed separately.

To meet the strategies, policies and goal stated in this management plan, new sportfishing regulations for lake sturgeon were developed based on angler opinion and population status of sturgeon in Alberta.

The following sportfishing regulations are scheduled for implementation in April 1997:

1. **South Saskatchewan River and Tributaries, including the Oldman, Bow and Red Deer rivers.**
 - a) the annual limit is one (1 tag per licence).
 - * the South Saskatchewan River population can only support a limited harvest.
 - * 60% of the anglers favoured an annual limit of 1 or 0.
 - b) the minimum-size limit is 130 cm in total length.
 - * female sturgeon reach spawning maturity between 130 and 140 cm in length.
 - * more anglers preferred large sturgeon than small sturgeon.
 - c) a Sturgeon Fishing Licence is required to keep sturgeon and the licence is only valid between June 16 and March 31 (0-limit between April 1 and June 15).
 - * the 0-limit helps protect sturgeon spawning, but still provides for fishing opportunities.
 - * 89% of the anglers supported spawning protection, but were split between a 0-limit and a season closure.
2. **North Saskatchewan River and Tributaries.**
 - a) catch and release only (0-limit all year).
 - * the North Saskatchewan River does not presently have a harvestable surplus of sturgeon beyond the needs of conservation and population recovery.
 - * 64% of the anglers favoured a 0-limit.
 - * 96% of the anglers supported spawning protection, with two-thirds favouring a 0-limit.

In summary, the Sturgeon Fishing Licence will be valid only for the keeping of one sturgeon (1 tag) over 130 cm in total length from the South Saskatchewan River system and only during the time period of June 16 to March 31. Fishing opportunities for sturgeon during their spawning period (April 1 to June 15) and in the North Saskatchewan River system throughout the year will be catch and release only.

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